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and second only showing feeble punctuation, and with the disk of the elytra destitute of the setigerous punctures that occur on the fourth and seventh intervals in *canadensis*. In *canadenis* the fourth interval bears six to eleven setæ, the seventh interval five to eight setæ; in *blanchardi* no setæ or setigerous punctures are found on these intervals. The submarginal interval also usually bears fewer setæ in *blanchardi* (about 12) than in *canadensis* (about 16). Length, 11 to 13 mm.

Occurs in White Mountains of New Hampshire and near the summit of Mt. Watatic in Massachusetts, very near the New Hampshire Line. Type from Randolph N. H., in my collection; other specimens in Mr. Blanchard's collection.

In regard to the subgenus *Pseudonomaretus,* it may also be added that the tendency toward a loss of the elytral striæ is carried further in a specimen in Mr. Blanchard's collection from North Carolina (Highlands) than in any of the described species in that only one sutural stria remains. It probably represents a new species, though additional specimens might show intergrading forms. The rarity in collections of most of the species of *Nomaretus* inhabiting the Allegheny Mts. makes their study difficult especially in determining the limits of individual variation.

NOTES ON CICADAS FROM THE UNITED STATES WITH DESCRIPTIONS OF SEVERAL NEW SPECIES.

BY WM. T. DAVIS,

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While the writer has a rather large collection of Cicadas from the United States, more material may cause the opinions here expressed to be considerably modified. Especially is this the case regarding those species originally described without locality, such as *swalei, olympusa, viridifascia* and *sex-guttata.* More specimens are also to be desired from the type locality of what is here considered as Say's *Cicada vitripennis.*[1]

[1] The author is indebted to Mr. Chris. E. Olsen for making a number of drawings of genitalia, and to Mr. Howard H. Cleaves for taking the photographs from which the plates have been made.

Cicada figurata Walker.

This species was described in 1858 in List of the Specimens of Homopterous Insects in the collection of the British Museum, Supplement, p. 19. Unfortunately no locality was given. The description in part is as follows: "Black, mostly tawny beneath. Head with a large tawny spot on each side in front between the eyes. . . . Prothorax reddish, black in front and behind, with a double tawny stripe; border tawny, with a black streak on each side. Mesothorax with four oblique tawny stripes; the middle pair recurved inward; the lateral pair enclosed at each of their tips by a lateral tawny streak; sides and hind ridges tawny. Legs tawny. Wings vitreous. Fore wings narrow, much acuminated testaceous at the base, and with a testaceous streak along the sixth discoidal areolet; primitive areolet black; veins piceous; costa testaceous to the tip of the front areolet; first and second transverse veins slightly curved, clouded with black. . . . Length of the body 17 lines; of the wings [expanse] 44 lines."

As far as the writer is aware the insect has not been recognized since it was described and the name has been placed as a synonym of *Cicada auletes* or *grossa* by Distant and of *Cicada marginata* by Uhler. Lately seven specimens have been examined that are well covered by the above description. They are as follows:

Logansport, DeSoto Co., Louisiana, August 1905, male. (Received from W. Dwight Pierce.) Coll. U. S. National Museum.

Verda, Grant Co., Louisiana, July, 1915, male. (Received from Prof. R. W. Harned.) Coll. Agri. College, Miss.

Alabama, female. Coll. Brooklyn Museum of Arts and Sciences.

Mobile, Alabama, female (H. P. Loding). Davis collection.

Mississippi, female. (Received from Prof. R. W. Harned.) Coll. Agri. College, Miss.

Meridian, Lauderdale Co., Miss., Sept. 10, 1915, female. (Rehn & Hebard). Davis collection.

Gainesville, Florida 1915, male. (J. R. Watson.) Davis collection.

All of the above mentioned are dull, tawny colored insects, with narrow and much acuminated fore wings with the primitive aerolet black. In the considerable number of specimens that we have of *Cicada resonans* and *Cicada similaris,* the fore wings are not as acuminate, and the primitive or basal aerolet is not black. The

membranes or flaps at the base of both the fore and hind wings are dark gray in both *resonans* and *similaris,* also in *lyricen,* whereas in what we take to be *figurata* they are yellowish in color, especially those of the fore wings, with a pinkish tinge. In *similaris* the uncus when seen in profile is shaped something like the head of a snake with expanded jaws; in what we have identified as *resonans,* the uncus when viewed in profile is broad at the tip and shaped somewhat like a horse's hoof, and when viewed from the back the extremity is broad and truncated and not notched. In what we consider *figurata* the uncus is simple. When it is seen in profile it is scoop-shaped, and from behind it is obtusely rounded with the extremity not as broad as in *Cicada lyricen* which it somewhat resembles. We formerly expressed the opinion (this JOURNAL, March, 1915, p. 8) that *Cicada figurata* might be either *Cicada lyricen* or *Cicada similaris,* but since we have seen the male from Louisiana referred to above and which we figure, we think that Walker's species has been rediscovered. Mr. Charles Schaeffer, of the Brooklyn Museum, has had, for some time, the female belonging to that institution set aside as a distinct species.

Cicada aurifera Say.

Thomas Say described this species in 1825, but recent authors have failed to identify it. Say says in part: "Body covered with golden pubescence; beneath hairy. Inhabits Missouri . . . the two particular anastomoses are strongly marked with blackish . . . thorax but little varied with black: scutel [mesonotum] black, with the usual testaceous lines: tergum black, densely covered with golden hair: beneath pruinose. Length one inch and a half nearly to the tip of the hemelytra. Found near the Konza village."

When Smith and Grossbeck wrote their paper "Studies in Certain Cicada Species," published in Entomological News, for April, 1907, they examined the specimens in the collection of the U. S. National Museum at Washington and noted on a label placed below two females from Kansas, "New Species." From lack of material they refrained from describing the insect which is here identified as *Cicada aurifera.* In 1914 the writer received a male of this species from Mr. J. C. Warren of Wakefield, Kansas, and more recently he has had the privilege through the courtesy of Prof. S. J. Hunter and Mr. R. H. Beamer of examining forty-nine additional specimens from the col-

lection of the University of Kansas. We think that the species represented by this extensive material is Say's long lost *Cicada aurifera.* It is of the right size; fresh specimens are pubescent; beneath hairy; the first and second cross veins conspicuously blackened, almost spot-like; the pronotum is almost wholly green and "little varied with black"; the mesonotum is black with the "usual tectaceous lines"; the tergum is black covered with golden hair in fresh specimens; beneath pruinose, and lastly most of the insects came from near the type locality, for Franklin Co., Kansas is not far from the site of the Konza Indian village visited by Thomas Say.

Uhler states in his Preliminary Survey of the Cicadidæ of the United States, Antilles and Mexico, Transactions Maryland Academy of Science, 1892, that *Cicada aurifera* was known only from the original description and adds: "It seems to be a pale variety of *C. canicularis,* which inhabits that state, but the size given is smaller than that of any specimens thus far brought to our notice." He was nearly correct in this, for *Cicada aurifera* is related to *Cicada canicularis* Harris, but still more closely to *Cicada davisi* Smith and Grossbeck. We figure a male *Cicada aurifera* from Franklin Co., Kansas, a male *Cicada canicularis* from Lake Mahopac, New York, and a male *Cicada davisi* from Manson, N. C. It will be seen that in *canicularis* the eyes are not set as obliquely as they are in *davisi,* and in *aurifera* they are still less prominent. In examples of the same expanse of wing, *aurifera* measures less across the head than does *davisi.* The uncus when seen from behind is broader in *canicularis* than in *davisi* and *aurifera,* but in *aurifera* the tip is more gradually rounded in either of the other two. Beneath the opercula are about of the same shape in all three species. The color pattern of the three species is similar. The pronotum is all green in *aurifera* with the exception of the triangular black spot contiguous to the anterior margin and enclosing a wedge-shaped spot of green. In *davisi* the pronotum is usually more black, but the hind margin or collar is green. In *canicularis* the collar is green with its front margin often edged with black. The mesonotum is blacker in *canicularis* than in either of the other two; the usual W-mark and elevated X of a lighter color, is present in all three. The tergum is black in the three species, but in *aurifera* the hind margins of the segments are often edged with testaceous. The wings of *canicularis*

and *davisi* are of the same shape, but in *aurifera* they are proportionately shorter and broader. The first and second cross veins of the fore wings are but slightly infuscated in *canicularis* and sometimes not at all; in *aurifera* the infuscation is sharply defined, while in *davisi* it is generally more indefinite and the ends of the fore wings are often clouded as well. Beneath, all three species are pruinose when fresh. *Canicularis* has the central area shining black and extending in the form of an irregular band to the end of the abdomen; in *davisi* this band is more green, especially along the sides and still less definite, while in *aurifera* the band is almost obsolete, in rubbed specimens there being usually an oblong black spot at the base of each segment on the under side.

The following specimens of *Cicada aurifera* have been examined:

Franklin Co., Kans., 895 ft., 23 males, 15 females (R. H. Beamer). Collection University of Kansas.

Anderson Co., Kans., 1047 ft. 1915, 2 males, 1 female (R. H. Beamer). Collection University of Kansas.

Allen Co., Kans., 962 ft., 1915, 3 males, 1 female (R. H. Beamer). Collection University of Kansas.

Riley Co., Kans., Sep., 1 female (Marlatt). Collection U. S. National Museum.

Kansas, 1 female (Marlatt). Coll. U. S. Nat. Museum.

Wakefield, Clay Co., Kans., Aug. 25, 1914, 1 male (J. C. Warren). Davis collection.

Seward Co., Kans., 2,600 ft., August 18, 1911, 2 males, 2 females (F. X. Williams). Collection University of Kansas.

Cicada townsendi Uhler.

In the collection of the United States National Museum there is a male cicada marked "Las Cruces" on one label, and "*Cicada Townsendii,* Uhler, New Mex." on the other. This is supposed to be one of the specimens from which Uhler drew up his original description, for he says that four of them came from the vicinity of Las Cruces, New Mexico. Mr. Otto Heidemann, in charge of the cicadas in the National Museum, has kindly permitted my having a figure made of the specimen, which is here presented. In addition to this typical specimen, we figure through the courtesy of Dr. Henry Skinner a smaller and more pruinose male from Alamogordo, New

México, May 10, 1902. Other material examined has been as follows:

Southern California. A female in the U. S. Nat. Museum bears the label "Southern Cal. (not Lower Cal.)."

"Texas." A rather small male and female. Coll. U. S. Nat. Museum.

Marfa, Tex. June 5, 1908, male and female (Mitchell and Cushman). Coll. U. S. Nat. Museum.

Marathon, Tex. June 7, 1908, female (Mitchell and Cushman). Coll. U. S. Nat. Museum.

In Utah, Colorado and Kansas there is another cicada that greatly resembles *townsendi,* but is a little smaller and has a very differently shaped uncus. It may be described as follows:

Cicada bifida new species.

Type male, Clear Creek, Colorado, July 23, 1914. Davis collection.

Allotype female, St. George, Washington Co., Utah (Engelhardt and Doll). Davis collection.

A black and yellow green colored species; fresh specimens conspicuously pruinose.

Head black, with the following yellowish tinged with green: a spot above the base of each antenna, a central triangular spot in front of the ocelli, an irregular spot of a little lighter color on each side near the eye and contiguous to the hind border, and a small spot on the front above the transverse rugæ. Pronotum yellowish green with a large central black spot which is broadened near the front margin, and to a very much less extent on the hind margin where it extends on to the collar. In some of the paratypes this black spot contains one of a yellowish green color. On either side the grooves are blackened, and the hind margin or collar is blackened in the center, as mentioned above, and has a black spot each side at the humeral angles. Mesonotum black with the central W-shaped mark near the front margin yellowish green in color; behind this is the elevated x also yellowish green and with the anterior marks extending well forward and nearly touching the W-mark. The sides near the base of the fore wings are also yellowish green. Tergum black with an indication of a dorsal row of pruinose spots faintly defined; sides of the abdomen irregularly bordered with yellowish green, the last segment being nearly all of that color except the central area which is darkened. The fore wings have the costal margins yellowish green nearly to the extremities of the wings and the subcostal veins are blackened; the first and second cross veins are darkened, but not conspicuously so. The basal areole of each fore wing contains a short darkened dash of color, otherwise they are nearly clear; the flaps of both the fore and hind wings are grayish white. Beneath

lighter and nearly of a uniform yellowish color, with a little black about the eyes and on the legs which are more or less streaked, the fore tibiæ and tarsi being nearly all blackened. Opercula slightly lighter colored than the segments; overlapping for more than half of their length; about half as long as the abdomen and symmetrically narrowed from each side to a rounded point. Uncus when viewed in profile slender and much curved, and when seen from

C. townsendi. C. bifida.

behind widened and deeply cleft at the extremity. It somewhat resembles in form the iron claw often used in pulling tacks. The insect is quite pruinose beneath, especially on the fore parts, and above, the pruinose areas often cover the lighter markings.

MEASUREMENTS (IN MILLIMETERS).

	Male Type.	Female Allotype.
Length of body	27	25
Width of head across eyes	9.5	9.5
Expanse of fore wings	71	72
Greatest width of fore wing	12	12
Greatest width of operculum	6	
Greatest length of operculum	9	

In addition to the type which is figured, and allotype, the follow-lowing specimens have been examined:

St. George, Washington Co., Utah, July, male (Engelhardt and Doll.) Davis collection.

Golden, Colorado, July 18 and 20, 1909. Male and female. Collection W. J. Gerhard.

Morton Co., Kans., 3,200 ft., June, 1902, one male and three females (F. H. Snow). Collection University of Kansas and Davis collection.

Hamilton Co., Kans., 3,350 ft., June, 1902, three males (F. H. Snow). Collection University of Kansas and Davis collection.

Garden City, Finney Co., Kans., June, 1895, male and female (H. W. Menke). Collection U. S. Nat. Museum.

Arizona, male. Uhler collection, U. S. Nat. Museum.

As has been stated *Cicada bifida* greatly resembles *Cicada townsendi* which, however, appears to range somewhat further to the south. It may be readily distinguished from that species by being smaller, by the less prominent front; by having the basal cell of the fore wings less black and the collar or hind margin of the pronotum of a nearly uniform color, that is it has not about the frontal half blackened as in *townsendi.* The uncus in *Cicada bifida* is deeply cleft at the tip, and simply rounded in *townsendi.* Further in *townsendi* the penis is armed with a chitinous pair of thorns dark in color and bent inward, which are not present in *Cicada bifida.*

Cicada castanea new species.

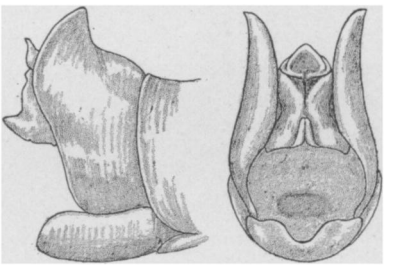
Type male, Jerome, Arizona, June (Oslar). Davis collection.

Allotype female, Prescott, Arizona (Oslar). Davis collection.

The triangularly shaped opercula of this species are proportionately much longer than they are in *Cicada cinctifera* from the same region, and they are also more rounded at the tips.

Head with the front ochraceous tinged with black and a small, brighter spot at apex. A broad, irregular black band connects the eyes, behind which, each side, are two ochraceous spots, and an oblong one of the same color is above the base of each antenna. Pronotum castaneous with a central longitudinal dark band dilated both anteriorly and posteriorly (in some of the paratypes enclosing a castaneous streak); the front margin narrowly lined with a streak of a lighter color. The posterior margin or collar clouded with black near the humeral angles, and yellowish on anterior angles, otherwise of the same color as the main portion of the pronotum. Mesonotum shining black with a faint castaneous W-shaped line outlining two obconical spots on the central part of the fore margin; the sides and the cruciform elevation castaneous with two black depressed dots near the upper extremities of the latter. Tergum castaneous with the tympanal areas lighter and each segment faintly clouded at base; last segment with a conspicuous pruinose spot each side. Fore wing with the costal margin green to the end of the radial cell, beyond darkened. Subcostal vein dark brown. The marginal cells down to the cubital cell slightly clouded with brown, but each cross vein heavily clouded, also an indication of several small, dark spots along the outer margin. One of the female paratypes constitutes a variety having the fore wings suffused entirely with brown, as well as about two thirds of the area of the hind wings. At base the fore wings are darkened, also a dark spot in each basal cell; the

membranule orange with a pinkish tinge. Hind wings orange at base, clouded beyond, the color spreading out over nearly all of the area of the last two anal cells. Beneath yellowish with a black spot contiguous to each eye and a few conspicuously black spots near the base of the legs, particularly those of the median pair. The triangularly shaped opercula are long and rather blunt at the lower extremities and extend about one half the length of the abdomen.



Cicada castanea

The uncus when seen in profile has at the extremity a projection like an upturned nose; when viewed from behind it is seen to be divided longitudinally through this nose; the ends are expanded and truncate. The last ventral segment of the female is doubly notched at its extremity, that is, it is broadly notched and this notch in turn has a central one.

MEASUREMENTS (IN MILLIMETERS).

	Male Type.	Female Allotype.
Length of body	19.5	20
Width of head across eyes	8	8
Expanse of fore wings	63	64
Greatest width of fore wing	10	10
Greatest width of operculum	4.5	
Greatest length of operculum	6	

In addition to the type which is figured, and allotype, the following specimens have been examined:

Jerome, Arizona, three males, two females (Oslar). Davis collection.

Prescott, Arizona, nine males (Oslar). Davis collection.

Baboquivari Mts., Arizona, male (F. H. Snow). Collection Univ. of Kans.

Santa Rita Mts., Arizona, female. Collection Brooklyn Museum of Arts and Sciences.

This species resembles somewhat *Rihana virgulata* Distant, from Mexico, figured in Biol. Centr.-Amer., Rhynch Hom. 1, p. 140, but in that insect the opercula are short, and the eyes are more prominent. It resembles still more closely *Rihana swalei* Distant, described without locality but supposed to come from Central America. The figure in Ann. Mag. Nat. Hist. (7), xiv, p. 427 (1904), shows a more robust-bodied species than *castanea* with more prominent eyes. There also appears to be differences in color pattern in the head, pronotum and mesonotum. *Castanea* from its form and character of genitalia, belongs near to *delicata* Osb., *reperta* Uhler and *sordidata* Uhler, that is in the genus *Cicada* as defined by Distant, and not in his genus *Rihana*. This species in time when more collecting has been done, may prove to be a variety of *swalei,* but the name *castanea* can still apply, especially to the variety with the fore wings entirely suffused with brown, as shown in the female from the Santa Rita Mts., Arizona, and included in the description.

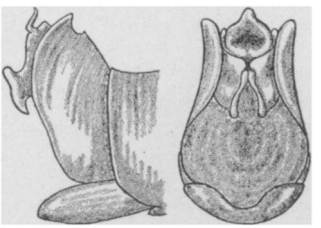
Cicada arizona new species.

Type male, Santa Rita Mts., Arizona, 5,000 to 8,000 ft., June (F. H. Snow). Davis collection.

In form resembling *Cicada castanea,* but smaller with clear wings and short rounded opercula.

Head black with a greenish yellow spot above the base of each antenna and one each side at posterior margin; median sulcus on front also greenish yellow. Pronotum greenish yellow with a central longitudinal dark band dilated both anteriorly and posteriorly; grooves narrowly lined with black; posterior margin or collar greenish yellow but clouded at the extremities. Mesonotum shining black with two curved lines in the form of parenthesis near the front margin and the cruciform elevation greenish yellow in color. There are two black, depressed dots near the upper extremities of the cruciform elevation. Tergum dark chestnut colored with the relatively large and protruding tympanal areas slightly lighter in color. Wings clear, with the costal margin yellowish to beyond the middle of the wing and then clouded; the subcostal vein is dark brown. First and second transverse veins clouded. Membranule of the fore wings pinkish at base; those of the hind wings more gray. Beneath yellowish and more or less pruinose; black about the eyes and pink on each side of the transverse rugæ; a few black spots near the base of the legs. The opercula are short, do not touch and have the extremities obliquely rounded. The uncus viewed in profile has a relatively large pro-

tuberance extending backward from its central portion, below which the extremity is bent inward in the form of a claw. Viewed from behind, it is seen that the uncus is divided longitudinally and that it ends in two claws separated considerably and from between which the penis protrudes.



Cicada arizona

MEASUREMENTS (IN MILLIMETERS).

	Male Type
Length of body	17
Width of head across eyes	7
Expanse of fore wings	52
Greatest width of fore wing	7.5
Greatest width of operculum	4
Greatest length of operculum	3

In addition to the type which is figured, five males have been examined, all from the Santa Rita Mts., Arizona, collected by Prof. F. H. Snow and in the collection of the University of Kansas.

Cicada eugraphica new species.

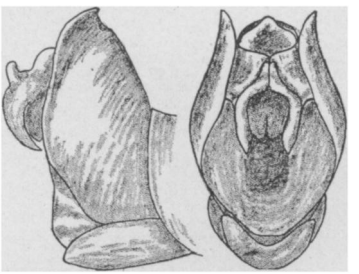
Type male, Albuquerque, Bernalillo Co., New Mexico. Davis collection.

Allotype female, Barstow, Ward Co., Tex., July 20, 1905 (J. C. Crawford). Collection U. S. National Museum.

An orange and black species with clear wings.

Head black with an orange spot above the base of each antenna and a larger one each side nearer the eyes; also one each side contiguous to the hind margin. The transverse rugæ are blackened, orange at the sides and an orange spot on the front; no longitudinal impressed line. Pronotum orange and black, the central longitudinal stripe conspicuously orange, with a dissected black band each side which is widened anteriorly and posteriorly; grooves blackened; collar orange, irregularly blackened along the front margin, also at the humeral angles. Mesonotum with four obconical black spots, the

inner pair short, the outer pair longer and extending backward to the elevated x; there is also a black stripe extending along each side from the x to the base of each fore wing. Between the x and the two central obconical spots there is an irregular cross-shaped spot, and the two depressed black points, common to many species, and near the anterior extremities of the x, are also present. The x and lighter lines on the mesonotum are orange. The tergum is a very dark brown; the segments narrowly edged with orange posteriorly, and the lateral grooves extending down the sides from the dorsal line are noticeable. The fore wings have their costal margins orange for about half of their length, beyond which they are blackened; the subcostal veins are very dark brown. The first and second cross veins of the fore wings are not clouded; both pairs of wings are orange at the base with the flaps grayish white. Beneath lighter colored, the legs orange, streaked and spotted with testaceous. The abdomen with the segments darkened along each side. Opercula light orange, a little less than half as long as the abdomen, and rounded



Cicada eugraphica

at the extremities, the inner edges touching or nearly so. Uncus when viewed in profile showing a considerable protuberance extending backward from its central portion, below which it terminates as a curved claw bent inward; when seen from behind of the wish-bone shape, stouter and with the extremities more bent toward each other than in the next species.

MEASUREMENTS (IN MILLIMETERS.)

	Male Type.	Female Allotype.
Length of body	22	23
Width of head across eyes	8.5	9.5
Expanse of fore wings	62	70
Greatest width of fore wing	9.5	11
Greatest width of operculum	5.5	
Greatest length of operculum	5	

In addition to the type, which is figured, and allotype, the following specimens have been examined:

Marfa, Presidio Co., Tex., June 5, 1908, three males (Mitchell and Cushman). Coll. U. S. Nat. Museum.

Van Horn, Culberson Co., Tex., June 19, 1909, male (F. C. Bishopp). Coll. U. S. Nat. Museum.

Barstow, Ward Co., Tex., July 22, 1905, male (J. C. Crawford). Coll. U. S. Nat. Museum.

Mesilla, Dona Ana Co., New Mex., July 1, 1897, male and female. Coll. Prof. A. P. Morse.

Alamogordo, Otero Co., New Mex., seven males (G. v. Krockow). Coll. Am. Museum Natural History.

Graham Mts., Ash Creek, Arizona, alt. 3,200 ft., May 30, 1914, male (E. G. Holt). Coll. U. S. Biological Survey.

Graham Mts., Arizona, June 29, 1914, male (E. G. Holt). Coll. U. S. Biological Survey.

San Bernardino Ranch, Cochise Co., Arizona, 3,750 ft., Aug., male (F. H. Snow). Coll. University of Kans.

Douglas, Cochise Co., Arizona, Aug., male (F. H. Snow). Coll. University of Kans.

Cicada eugraphica is sometimes labeled in collections *Cicada vitripennis* Say which it resembles, but this last is a much lighter colored and greener insect with the fore wings narrower, and the uncus, when seen in profile, with the curved claw more slender. *Cicada vitripennis* also occurs more to the eastward.

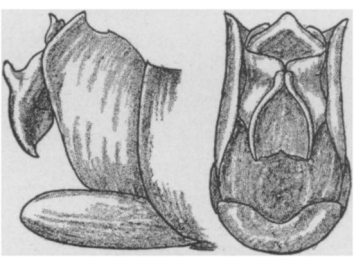
This is not the Mexican *Cicada crucifera* Walker, in which the second marginal areolet is very much longer than the first, whereas in *eugraphica* the first is much longer than the second.

Cicada texana new species.

Type male, Lyford, Cameron Co., Texas, Aug. 6–7, 1912 (Rehn and Hebard). Davis collection.

Head with the black band that extends between the eyes in many species here broken up into spots as follows: the region about the ocelli is black, there is a black spot on each side of this and there is black about the eyes. The transverse rugæ are streaked with black and there is a green spot centrally on the front. The remainder of the head is greenish or yellowish green. Pronotum yellowish green with a central, longitudinal broad stripe of a lighter green. On either side of this are two interrupted black stripes with their extremities broadened at the anterior margin. Beyond this the furrows are blackened. The hind margin or collar is uniformly green in color in the type and three of the paratypes; in the fourth there is a brownish point each side

near the humeral angles. Mesonotum with two short obconical black spots at the fore margin, on either side of which there is a much dissected dark band, broadest anteriorly and extending backward to the extremities of the elevated x; there is also a dark stripe extending along each side from the x to the base of the fore wings. There is an irregular cross-shaped spot between the x and the two central obconical spots, and the two depressed black points, common to many species, and near the anterior extremities of the x are also present. The x and lighter lines on the mesonotum are yellowish in the type, but the x is greener in the paratypes. The tergum is testaceous; the tympanal areas lighter, each darkly clouded near its center, and the segments are lighter in color along their posterior margins. The dorsal surface is more or less covered with a short, silken, light-colored pubescence. The fore wings have the costal margins greenish yellow for about half of their length, beyond which they are blackened; the subcostal veins are dark brown. The first and second cross veins of the fore wings are clouded, and the flaps at the base of both fore and hind wings are whitish or grayish white. Beneath lighter colored and pruinose, blackened about the eyes, the legs yellowish, streaked and spotted with testaceous. The abdomen nearly uniformly colored except the darker spot on the last ventral segment and a linear one on the valve; segments slightly darkened along the base. Opercula yellowish, a little less than half the length of the abdomen and rounded at the extremities, the inner edges almost touching. Uncus when viewed in profile with the inner edge not



Cicada texana

deeply notched, as in some species, but more rounded with the extremities bent inward, and when viewed from behind the hard raised portion resembles in shape a widely arched wish-bone. In *Cicada sordidata* Uhler the uncus, when viewed in profile, has the claw-like extremities freer and bent inward to a greater extent, and when viewed from behind the wish-bone arch is not as wide.

MEASUREMENTS (IN MILLIMETERS).

	Male Type.
Length of body	22
Width of head across eyes	8.5
Expanse of fore wings	58
Greatest width of fore wing	9
Greatest width of operculum	4.5
Greatest length of operculum	5

In addition to the type, which is figured, and which is a rather small individual, the following specimens have been examined:

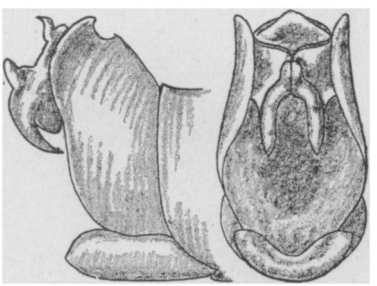
San Benito, Cameron Co., Tex., fifteen males. Davis collection.

Brownsville, Cameron Co., Tex., three males (F. H. Snow). Coll. University of Kans.

Cicada texana closely resembles *Cicada sordidata* Uhler from Florida and Georgia, but may be separated from that species by the differently shaped uncus, by the less prominent grooves extending laterally down the sides of the abdominal segments and by having a somewhat brighter color pattern. There also seems to be, judging from the material at hand, some constant differences in color.

Cicada olympusa Walker.

Cicada sordidata Uhler, was described in the Transactions of the Maryland Academy of Sciences, 1892, p. 175, from two males from Southern Florida. We figure a male from Big Pine Key, Fla., Sept.



Cicada sordidata

19, 1913, that has been compared with one marked "S. Fla." in Uhler's collection in the United States Nat. Museum, and labeled in his handwriting "*Cicada sordidata.*" This was no doubt one of his

types. His published description is very full and among other things he says that the first three apical areoles of the fore wings "including the veins and cross veins smoke-brown." This is subject to some variation, though the first and second cross veins are always clouded in mature specimens. He says: "Opercula short, pale, but little more than one-third the length of the abdomen, narrowing toward the tip, and rounded there; the tips widely separated by a wedge-shaped space; the drums completely covered by an inflated segent, with a wide interval between, which is occupied at the outer end by a smooth hump. The raised smooth line thus begun is continued back upon the succeeding tergal segments, and from each prominence a grooved line extends outwards to the border of the segments."

Cicada olympusa Walker was described in 1850, but no locality was given. It has been credited to North America by Distant. The description would seem to cover *Cicada sordidata* which is of the same size and we have been unable to find any other species in collections that fits it so well. Walker says in part: "scutcheon of the fore-chest [prothorax] adorned with four black stripes; the middle pair long, widened on the fore border and on the hind border; the outer pair short and slightly curved; furrows and sides blackish; hind scutcheon [hind margin or collar] green, widened, rounded and adorned with a large pitchy mark at the base of each fore-wing, nearly straight on each side: scutcheon of the middle chest [mesonotum] adorned with four obconical black stripes; inner pair short with tawny borders; outer pair much longer, excavated into eight separate parts; a large black spot with a black dot on each side between the inner pair and the cross-ridge . . . fore borders of the [abdominal] segments adorned with pitchy interrupted bands; overduct ferruginous: drums pale tawny, very small, far apart; inner sides pitchy."

If it is meant that the extremities of the opercula are far apart then the above description agrees with *sordidata,* in which, however, the upper and inner edges of the opercula touch or nearly so.

Cicada milvus was described by Walker in 1858 from a single female from the "United States" and has been placed by Distant as a synonym of *Cicada olympusa.* Walker describes *milvus* as reddish tawny and says in part: "Prothorax with four black stripes, the

inner pair approximate, connected by a short black band in front, the outer pair very near the borders; two black discal dots; hind border greenish. Mesothorax with four conical black stripes, the inner pair short, the outer pair much intersected. Abdomen with an interrupted black band on each segment. Wings vitreous; veins pale green, black towards the tips. Fore wings with the first and second transverse veins clouded with dark brown." The wings are said to expand 27 lines, that is about 57 mm.

Cicada viridifascia Walker.

Cicada sordidata has been placed by Distant as a synonym of *Cicada viridifascia,* but this last is a larger insect, about the size of *Cicada reperta* Uhler. *Cicada viridifascia* was described in 1850 without locality. Walker says in part: "wings colorless; fore border tawny for half the length, black from thence till near the tip; veins tawny; cross-veins and adjoining parts of the longitudinal veins tawny; primitive areolet partly brown; fore-flaps whitish, as are also the hind-flaps at the base. Length of the body 11–12 lines [24–26 mm.]; of the wings [expanse] 33–34 lines [70–72 mm.]." This as well as the remainder of the description covers fairly well *Cicada reperta* Uhler, which has been found along the Atlantic coast from North Carolina to Southern Florida, but it does not cover *Cicada sordidata,* which has the first and second cross veins in the fore wings clouded and expands about 60–65 mm.

Cicada vitripennis Say.

What we have identified as this species is an insect with green in its coloring as mentioned by its describer; not entirely orange and black as in *Cicada cugraphica* from further west. Say says that the insect was presented to him by Mr. Nuttall "from the Arkansaw," and we figure a reddish green female collected by Mr. Alanson Skinner, July, 1914, at Perkins, Oklahoma, as probably from somewhere near the type locality. We have three additional specimens, all males and a little smaller of what appear to be of the same species, collected by Mr. W. J. Gerhard in July at Miller, Indiana, and Clark Junction, Indiana. Though a number of collections have been examined no species that so well fits Say's description has so far been found, but future collecting in the region from which the type came, may add to our knowledge in this particular.

A male *Cicada erratica* from Shreveport, La., kindly loaned by Prof. Herbert Osborn, its describer, is also figured. It is one of the seven males from which the original description was made and the figure here given of the genitalia will further serve in identifying the species. The genitalia of this insect is like that of the three much

Cicada erratica

smaller males from Indiana, mentioned above. We have a number of specimens of *erratica* from Logtown, La., June (E. S. Tucker, La. Agri. Exp. Sta.); Palmyra Island, about thirty miles below Vicksburg, Miss., June (R. N. Lobdell); Agri. College, Miss., July (H. E. Cox), and Scotts, Ark., August (John M. Moose, Jr.). The last three were kindly sent to me by Prof. R. W. Harned, to whom I am indebted for many cicadas. In the collection of the U. S. National Museum there is a female from Alexandria, La., June 22, 1910 (E. S. Tucker), and Prof. Harned has a specimen collected at Rosebloom, Miss., in August, 1915.

From present information we think that these related insects should be arranged as follows:

Species with first and second cross veins infuscated.

Cicada olympusa Walker, 1850.
Cicada milvus Walker, 1858.
Cicada sordidata Uhler, 1892.
Cicada texana Davis.

Species with clear wings.

Cicada eugraphica Davis.

Cicada viridifascia Walker, 1850.
Cicada reperta Uhler, 1892.
Cicada vitripennis Say, 1830.
Cicada erratica Osborn, 1906.

It will be noted that the above arrangement is not in accord with that to be found in Genera Insectorum where some of the species mentioned are in the genus *Rihana* and others in *Cicada.* However, all of the species mentioned above have a general likeness, and if the uncus is examined it will be found to be of the wish-bone pattern. We think that all the species with the uncus simple, as for example *linnei, lyricen, similaris, pruinosa, sayi, canicularis, davisi, marginata, auletes, resh, figurata, resonans, superba* and others might well be placed in *Rihana,* or in some genus to separate them from those with the wish-bone shaped uncus, which we have here placed in *Cicada.* This would necessitate the removal of *Cicada dorsata* Say, as it appears in Genera Insectorum, to the genus *Rihana,* for it has a simple uncus and we think that this should be done. It is a very easy matter to relax a male cicada and pull out the genitalia with a pin so that part will dry in a position where it can be examined. In this way the genera *Rihana* or *Tibicen,* and *Cicada,* can be separated more satisfactorily than by comparing the relative length of the head with the space between the eyes.

Cicada delicata Osborn.

We figure one of the five typical males of this distinct species, from Cameron, Cameron Co., La., which Prof. Herbert Osborn has kindly sent to us for comparison.

The following records may be added:

Brownsville, Tex., June, four males, one female (F. H. Snow). Coll. University of Kans., and Davis collection.

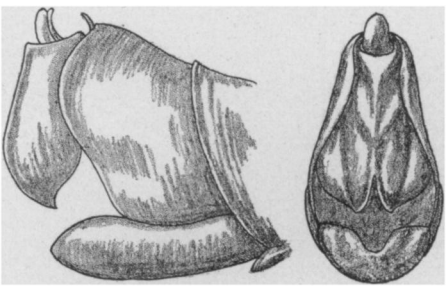
Katherine, Willacy Co., Tex., Aug. 8, 1912, female (Rehn and Hebard). Davis collection.

Del Rio, Valverde Co., Tex., 900–1,100 ft., Aug. 22, 23, 1912, male (Rehn and Hebard). Davis collection.

Cicada hieroglyphica Say.

This species was described in 1830 by Say, who says that it "Inhabits Pennsylvania and New Jersey," but is "rather rare." There are localities in the Pine Barrens, however, as for example Lake-

hurst, N. J., where in late June and in July it is often very common, and on warm days the songs of the numerous individuals constitute an almost continuous performance. We figure a male from Lakehurst, which will give a good idea of its size, form and wing pattern. The head, pronotum and mesonotum are tawny, tinged with green and marked with black as mentioned by Say; the abdomen tawny, narrowly lined between the tympana with black; a short longitudinal line on the dorsum of the second segment, the basal half of the last segment and most of the supra-anal plate, are also black. There is a conspicuous black spot behind each eye, not mentioned by Say, and



Cicada hieroglyphica

the black marks on the head, pronotum and prothorax are well defined. In the writer's collection there are specimens of this species, in form and markings like those from New Jersey, from Southern Pines, N. C., Clayton, Ga., Grand Bay, Mobile Co., Ala., and Osyka, Pike Co., Miss.

E. F. Germar in Thon, Entomologisches Archiv, 11, 2, p. 4 [should have been p. 40], 1830, gives a description of *Cicada characterea*, which he says inhabits Georgia, America. The description is short but it covers *Cicada hieroglyphica*, and from the locality given there seems to be no doubt but what that was the species intended. This description has been overlooked of late years and has not been brought to the attention of entomologists, the name not appearing in Genera Insectorum. The question arises which name has priority as both *Cicada hieroglyphica* and *Cicada characterea* are recorded as having been proposed in 1830. Say's description appeared in the Journal of the Academy of Natural Sciences of Philadelphia and

pages 179–244, which include his paper, were not published until August 1830, or later.

Cicada johannis Walker.

This was described in 1850, and St. John's Bluff, Florida, is given as the type locality. *Johannis* has been placed by Distant as a synonym of *Cicada hieroglyphica* and it probably is only a race. It, however, presents some differences and the writer for some time has regarded specimens from Florida as separable from typical *hieroglyphica.* In specimens otherwise of the same size the distance across the head at the eyes is generally greater than in New Jersey individuals, and the marks on the head, pronotum and mesonotum are more in the nature of black spots and dashes than of continuous lines. The black spot behind each eye is reduced to a narrow basal line in *johannis* and below the transverse black band on the front the region of the rugæ is unicolorous. In *hieroglyphica* there is usually a dark line running down the median groove of the transverse rugæ. There are a number of other color differences that are quite constant. We have a male from Carrot Island, near Beaufort, N. C., June 23, 1913 (F. Harper), that is marked like the specimens from Florida, showing that we may expect *johannis* along the coast. A male of *Cicada johannis* from La Grange, Brevard Co., Florida, is figured.

A few pages further on in the same publication where *Cicada johannis* was described, namely in the "List of the Specimens of Homopterous Insects in the Collection of the British Museum," Part 1, Walker describes *Cicada sex-guttata* without locality. He says the wings expand 30 lines instead of 26–28 lines as in *johannis* and that the tympana (he calls them opercula) are small instead of large as in *johannis.* His lengthy description of the color pattern fits the Florida species quite as well as any of the others here considered and many specimens from Florida are also of the size of his *sex-guttata.* This species has been placed by Distant as a synonym of *hieroglyphica,* but when large collections have been made some locality may yield specimens to fit the description.

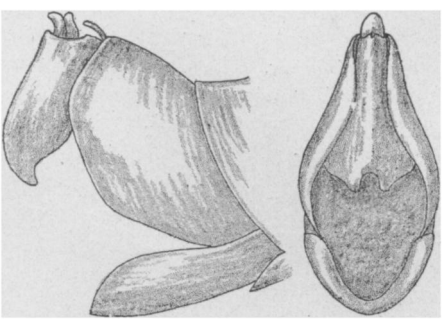
Cicada chisos new species.

Type male, Chisos Mts., Brewster Co., Texas, June 10–12, 1908 (Mitchell and Cushman). Collection U. S. Nat. Museum.

Allotype female, same locality and date. Davis collection.

Closely resembles *Cicada hieroglyphica* in markings, but is larger and has differently shaped fore wings, opercula and genitalia.

Head greenish tawny with a black spot each side slightly above the base of each antenna and adjoining the upper transverse rugæ. Front without any median groove at the upper portion of the transverse rugæ, its place being taken by an oblong greenish orange spot, rounded at the top and pointed at the bottom; each side the ridges of the rugæ are greenish orange and the grooves blackened. The region about the ocelli is included in a broad, somewhat U-shaped black mark, each side of which there is a large, curved, black spot extending toward the eye. There is a black mark on the inner side of each eye which extends backward so that the area behind each eye is wholly black. Pronotum greenish tawny, the central area occupied by two parallel black irregular marks widened before and behind until they meet, leaving a central dart-shaped area of a lighter color, the point of which points backward and extends to the collar. Each side of the two central marks there is a short, parallel irregular black stripe and the grooves are blackened. The hind margin or collar has on each side on its anterior edge, but nearer the humeral angles, a short black mark and on each humeral angle there is a broad curved black band extending to the eye. The mesothorax has extending backward from its fore margin seven black marks, the central one a narrow stripe extending backward nearly to the x. The next two marks on either side of the central one extend backward for nearly one half of the length of the pronotum; next comes a short spot with posterior end pointed and then the outer broad, black stripe extending backward nearly to the x and having a curved spot adjoining it at almost right angles. The x has a spot at each of its anterior extremities, otherwise it is greenish tawny like the rest of the mesonotum. The hind border is slightly more excavated at the x than in either *hieroglyphica* or *johannis*. Abdomen tawny, narrowly lined between the tympana with black; the basal half of the last segment and the supra-anal plate also black. The region of each spiracle is slightly clouded. The tympana are small with their anterior margins rounded and not covering the openings as



Cicada chisos

completely as in *hieroglyphica* and *johannis*. Beneath lighter, nearly unicolorous; black about the base of the rostrum; also at the base of the abdomen and each side near its tip. There are a few dark spots on the legs. The opercula are small and are more fully rounded out, that is, the outer margin of each one forms more nearly a part of a circle than in *hieroglyphica*. The uncus, which is figured, when seen from behind is broadly notched with the upper part of the notch rounded, and not narrowly notched as in *hieroglyphica*.

MEASUREMENTS (IN MILLIMETERS.)

	Male Type.	Female Allotype.
Length of body	27	22
Width of head across eyes	8	8
Expanse of fore wings	68	67
Greatest width of fore wing	11	10
Greatest width of operculum	3.5	
Greatest length of operculum	3	

In addition to the types the male of which is figured and will show the wing pattern, two paratypic males of the same date and locality have been examined. There are also many more specimens from the same locality in the collection of the U. S. Nat. Museum.

From *Cicada sex-guttata* of unknown locality, *Cicada chisos* differs in being larger, and in having a different color pattern on the head, pronotum and mesonotum. In Biol. Centr.-Amer., Rhynch. Hom. 1. Tab. 3, Figs. 2, 2*a* and 2*b*, a Mexican specimen is figured under the name of *Tettigia hieroglyphica* Say. With the exception of the shape of the opercula, which are fully rounded in *Cicada chisos*, the illustrations represent quite well the species under consideration.

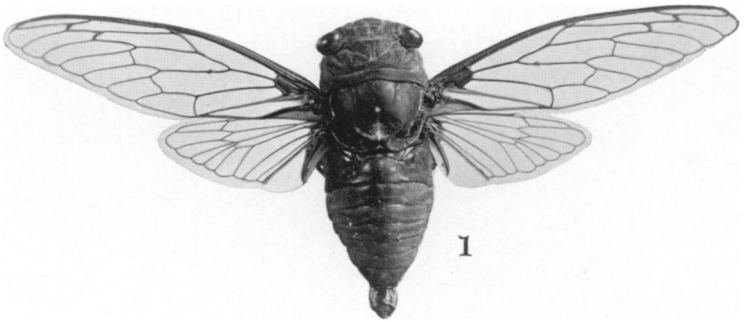
EXPLANATION OF PLATES.

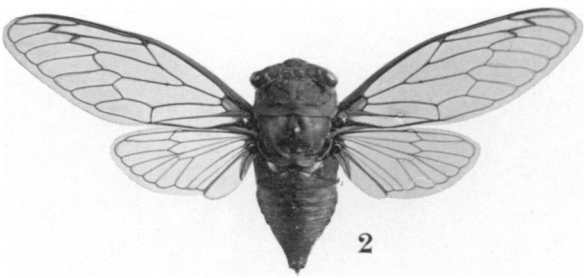
PLATE III.

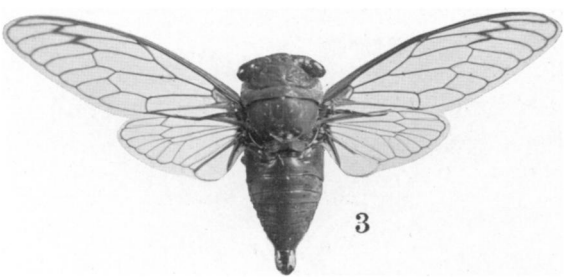
Fig. 1. *Cicada figurata* Walker.
Fig. 2. *Cicada canicularis* Harris.
Fig. 3. *Cicada davisi* Smith and Grossbeck.
Fig. 4. *Cicada aurifera* Say.

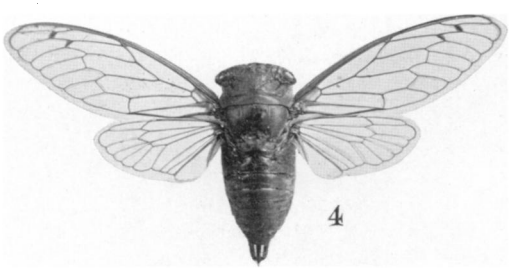
PLATE IV.

Fig. 1. *Cicada townsendi* Uhler. Type.
Fig. 2. *Cicada townsendi* Uhler.
Fig. 3. *Cicada bifida* Davis. Type.
Fig. 4. *Cicada bifida* Davis, enlarged.
Fig. 5. *Cicada castanea* Davis, enlarged.









Cicadidæ.

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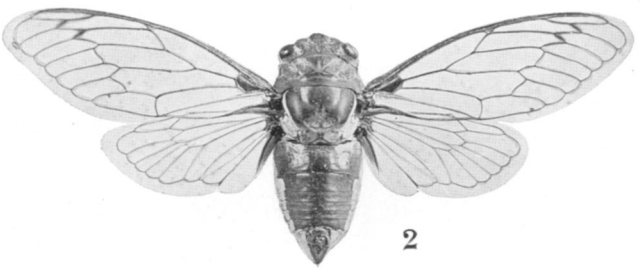

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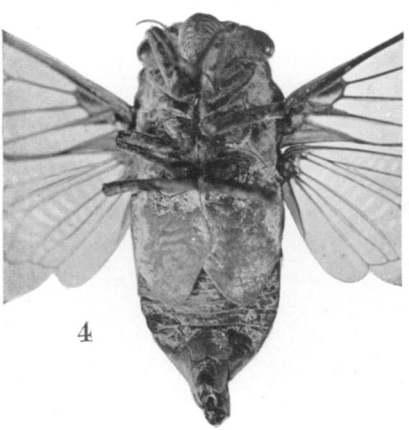

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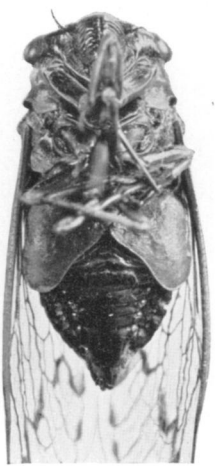

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Cicadidæ.

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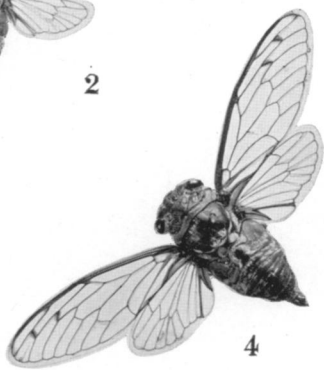

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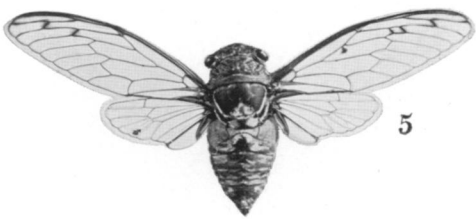

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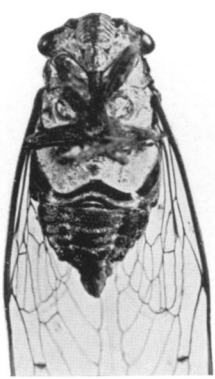

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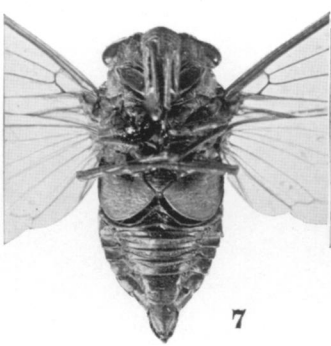

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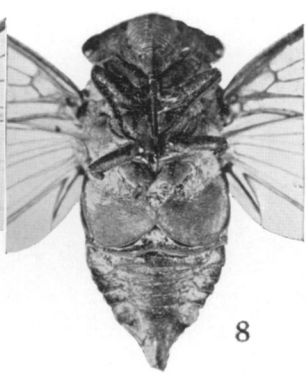

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Cicadidæ.

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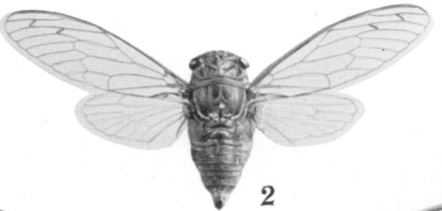

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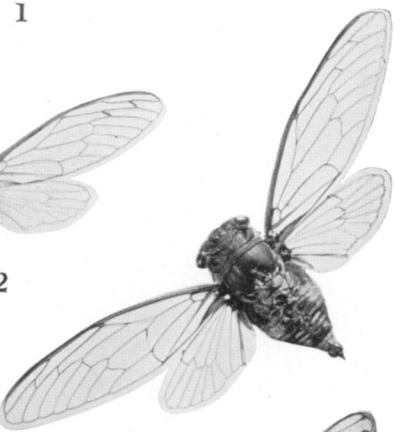

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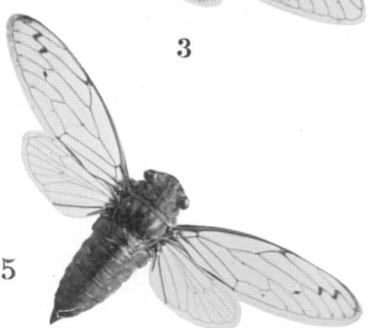

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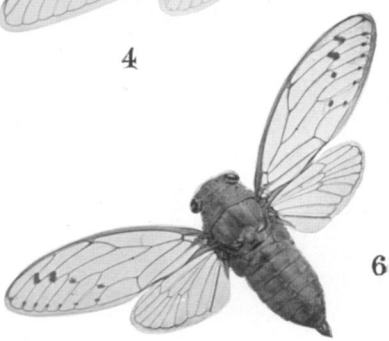

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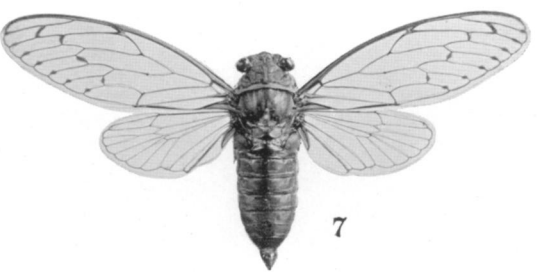

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Cicadidæ.

PLATE V.

Fig. 1. *Cicada castanea* Davis. Type.
Fig. 2. *Cicada arizona* Davis. Type.
Fig. 3. *Cicada eugraphica* Davis. Type.
Fig. 4. *Cicada texana* Davis. Type.
Fig. 5. *Cicada sordidata* Uhler.
Fig. 6. *Cicada arizona* Davis, enlarged.
Fig. 7. *Cicada eugraphica* Davis, enlarged.
Fig. 8. *Cicada texana* Davis, enlarged.

PLATE VI.

Fig. 1. *Cicada reperta* Uhler.
Fig. 2. *Cicada delicata* Osborn.
Fig. 3. *Cicada vitripennis* Say.
Fig. 4. *Cicada erratica* Osborn.
Fig. 5. *Cicada hieroglyphica* Say.
Fig. 6. *Cicada johannis* Walker.
Fig. 7. *Cicada chisos* Davis. Type.

NEW DIPTERA OF THE FAMILY ASILIDÆ WITH NOTES ON KNOWN SPECIES.

BY CHAS. SCHAEFFER,

BROOKLYN, N. Y.

While rearranging the museum material of the dipterous family Asilidæ, the following species were found among the unidentified material which appear to be new.

Stenopogon tenebrosus Coquillett.

The type of this species is not in the National Museum as Back[1] erroneously states, but in the Museum of the Brooklyn Institute. The specimen has the type label in Coquillett's handwriting.

Lasiopogon arizonensis new species.

Mystax white, pubescence of head anteriorly white, posteriorly yellowish. The usual median and lateral stripes of thorax brownish, median stripe very feebly divided by a paler line and not extending to the base, elsewhere the vestiture is gray; surface with a few short, white hairs, longer hairs poste-

[1] Trans. Am. Ent. Soc., XXXV, 207.